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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/819,923      | 03/26/2001  | Michael P. Caren     | 10981712-2          | 4359             |

7590

04/08/2002

AGILENT TECHNOLOGIES, INC.  
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| EXAMINER |
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SIEW, JEFFREY

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1637

DATE MAILED: 04/08/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/819,923

Applicant(s)

CAREN ET AL.

Examiner

Jeffrey Siew

Art Unit

1656-1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2001.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-24 and 26-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-24 and 26-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 6.                      6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. The response filed 12/27/01 regarding the art rejections has been fully considered and deemed not persuasive. Regarding the 102(b) rejections over Deeg et al (US5,338,688), the response raises the point that one skill in the art would not have had a reasonable expectation of success in being able to successfully deposit a nucleic acid by thermal inkjet such that the deposited nucleic acid would retain its ability to hybridize to its complement. The response further raises US5,658,802 as stating that thermal ink jets are very stressful on fluid and unsuitable for dispensing applications other than those where the composition of ink can be fully controlled (see col. 2 lines 14-19). First of all, Hayes art which was not relied upon in the rejections, does not teach explicitly teach that the thermal inkjets are unsuitable for **nucleic acids or biological components** per se but rather generally unsuitable where the composition of **ink** unless carefully controlled. Nucleic acids and ink are totally two different substances with different physical and chemical properties. The relative expectation of success for one component do not necessarily translate to a totally chemical different chemical class. Particularly, in light of the state of molecular biological art at the time the invention was made, DNA was known to have quite high thermal stability at high temperatures e.g. PCR, denaturation and hybridization experiments. Moreover, Hayes also adds the use of thermal inkjets may be applied provided that ink is carefully controlled. In fact Hayes does not teach in the impossibility of other applications but rather gives guidance as to what one skilled in the art should heed in doing so. The relative expectation of success remains sufficient. **More importantly**, the line of argument does not overcome a 35 U.S.C 102(b) or 102(e) rejection. 35 U.S.C. 103 has the

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element of reasonable expectation of success (see MPEP 2142). With regards to the 35 U.S.C. 102(b) rejection, the argument is found unconvincing.

With regards to the 102(e) rejection, the response states that Gamble disclosure is not enabling and cites *In re Donohue* 226 USPQ 619 (Fed. Cir. 1985). *Nomura et al* prior art at issue in *Donohue* was a *J. Chem Soc'y (B)* pp. 956-960 (1970) article. The article is a non US patent. *Gamble et al* is an issued US patent has the presumption of validity. The burden on applicant to demonstrate non enablement in an issued US patent is high. The response has not presented any evidence. The rejections over the cited prior art are therefore maintained.

The terminal disclaimer of US6,221,653 has been deemed proper and entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22,23,26-31,34,37 & 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Deeg et al (US5,338,688 August 16, 1994).

Deeg et al teach a method of depositing biochemical analytical liquid such as containing a protein to a target using a jet from a jet chamber in which a partial volume of liquid in chamber is evaporated and expanded prior to ejection (see abstract & claim 1). The jet head contains a chamber and a jet orifice which is connected to reservoir (see Fig. 1). They teach that a Hewlett-

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Packard Quiet Jet plus ink-jet printing head is used (see column 6 line 59). They teach forming a droplets in predetermined pattern (see claim 3). They also teach various reagents including wash solution. They teach that the device is used to bind biotinylated reagents to a surface coating containing streptavidin (see col. 5 line 49-51). They measure changes as result of reagent between sample and reagents (see claim 16).

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 22,23,26-31,34 & 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Gamble et al (US5,958,342 Sept 28,1999).

Gamble et al teach a jet droplet device using heat transducers or bubble jets (see abstract & col. 3, line 32). The bubble jet employs a heating element to produce droplets (see col. 8 line 50). They contain heater channel that is connected to distal reservoir containing fluid and terminates at orifice. The inkjet is used detection assays. Samples pulse jetted onto arrays that are spotted with one or members of an assay e.g. an analyte, oligonucleotide or probe. A wash step is performed prior to the detection step (see column 4 lines 23-57). The inkjet is also positioned by x-y positioner (see Fig. 6 & 7).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 24,32,33,35,36 & 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Gamble et al (US5,958,342 Sept 28,1999) or Deeg et al (US5,338,688 August 16, 1994) either in view of Cornell (US6,132,030 Oct. 17, 2000) .

The teaching of Gamble et al and Deeg et al are described previously.

Gamble et al do not teach uJ of heat..

Cornell teach the use of specific power requirements in determining the heat power density for ejecting from thermal inkjet.

One of ordinary skill would have been motivated to apply Cornell teaching of power to apply various heat power density to Gamble et al's inkjet device in order to optimize the ejection

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quality. Cornell states that controlling the heat increases quality by maximizing ink droplet velocity and increasing nucleation time (see col. 1 line 36- col. 2 line 5). It would have been prima facie obvious to use the Cornell teachings of the power heat variables to print quality to increase the quality of expelling in Gamble et al's device.

**THE FOLLOWING IS A NEW GROUND OF REJECTION NECESSITATED BY THE  
AMENDMENT**

***Double Patenting***

5. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Claims 22,23,25,26,27-31 34,& 37 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that 9,10,12,-14,16,17,20,27 & 28 of copending Application No. 09/150501. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

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6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 24,33,35,36 39 & 40 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9,10,12,-14,16,17,20,27 & 28 of copending Application No. 09/150504. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Claims 24,33,35,36 39 & 40 of the instant application are drawn to method of depositing a nucleic acid on the substrate using a thermal inkjet with specific microjoule energy pulse.

Claims 9,10,12-14,16,17,20,27 & 28 of US09/150504 are drawn to the method of depositing on nucleic acid on substrate with a thermal inkjet where in the deposited nucleic acid is capable of hybridizing to its complement.

Claims 9,10,12-14,16,17,20,27 & 28 are not drawn to the microjoule energy pulse.

Cornell teach the use of specific power requirements in determining the heat power density for ejecting from thermal inkjet.

One of ordinary skill would have been motivated to apply Cornell teaching of power to apply various heat power density to the method claims of US09/150504 in order to optimize the ejection quality. Cornell states that controlling the heat increases quality by maximizing ink



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droplet velocity and increasing nucleation time (see col. 1 line 36- col. 2 line 5). It would have been prima facie obvious to use the Cornell teachings of the power heat variables to print quality to increase the quality of expelling.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### SUMMARY

10. No claims allowed.

### CONCLUSION

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

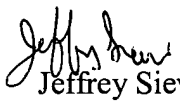
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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Siew whose telephone number is (703) 305-3886 and whose e-mail address is Jeffrey.Siew@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route. The examiner is on flex-time schedule and can best be reached on weekdays from 6:30 a.m. to 3 p.m. If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703)-308-1119.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist for Technology Center 1600 whose telephone number is (703) 308-0196.

Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Center numbers for Group 1600 are Voice (703) 308-3290 and Before Final FAX (703) 872-9306 or After Final FAX (703) 30872-9307.

  
Jeffrey Siew  
Primary Examiner  
April 5, 2002